

Remarks/Arguments:

Claims 1, 2, and 4-14 are presently pending. Claims 1 and 9 are amended. Reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 2, and 4-14 stand rejected under 35 U.S.C. 103(a) as unpatentable over Haniya et al. (US Pub. 2004/0261562) in view of Takayanagi (JP 408057648) and Terada et al. (US Pat. 6,250,174). It is respectfully submitted, however, that the claims are patentable over these references for the reasons set forth below.

Claims 1, 2, and 4-8

Applicants' invention, as recited by claim 1, includes a feature which is not disclosed, taught, or suggested by the cited art, namely:

...a wire feeder provided to the second arm and being rotatable relative to the second arm around a rotation axis...

...a rotating hollow pipe shaft located coaxially with the rotation axis of the wire feeder...and...

...a feeder cable electrically coupling between an inside of the industrial robot and the wire feeder, the feeder cable passing through the rotating hollow pipe shaft....

The wire feeder is rotatable relative to the second arm around a rotation axis. The rotating hollow pipe shaft is located coaxially with the rotation axis of the wire feeder. The feeder cable passes through the rotating hollow pipe shaft to electrically couple the wire feeder with the industrial robot. This feature is found in the original application, for example, at page 5, line 19 to page 6, line 24, and FIGS. 2 and 3. No new matter is added.

The Office Action acknowledges that Haniya fails to disclose "the rotation axis is composed of a rotating hollow pipe shaft having a first end and a second end opposite the first end, and the feeder cable passes through the rotating hollow pipe shaft from the first end to the second end." Applicants respectfully submit that the addition of Takayanagi and Terada fails to make up for the deficiencies of Haniya with respect to claim 1.

Takayanagi is directed to a welding robot. As illustrated in FIGS. 1 and 2, for example, Takayanagi discloses a welding robot having a wire feeding device 7. Feeding device 7 is attached to a third arm 33 of the robot using a movable base 76. As illustrated in FIG. 3, movable base 76 can be rotated around shaft 74. See Takayanagi at paragraph [0074].

Takayanagi fails to disclose, teach, or suggest shaft 74 being a rotating hollow pipe shaft. Thus, Takayanagi also fails to disclose, teach, or suggest a feeder cable passing through a rotating hollow pipe shaft. This is different from claim 1, which requires a rotating hollow pipe shaft located coaxially with the rotation axis of the wire feeder, and a feeder cable passing through the rotating hollow pipe shaft to electrically couple the wire feeder with the industrial robot.

Terada is directed to a construction robot. As shown in FIGS. 1 and 2A, for example, Terada discloses a robot 1 having a first arm AM1 and a second arm AM2. The robot 1 also includes an electrical cable CB for providing power to the motors that drive the robot arms AM1 and AM2. Cable CB enters arm AM2 at the location of axis X3. See Terada at column 2, lines 40-59; column 4, lines 3-24; and FIGS. 1 and 2A.

Terada fails to disclose a wire feeder on the construction robot. Thus, Terada fails to disclose, teach, or suggest a rotating hollow pipe shaft disposed coaxially with the axis of rotation of a wire feeder. To the contrary, Terada solely discloses a first robot arm AM1 and a second robot arm AM2 that are rotatable relative to each other. This is different from claim 1, which requires a rotating hollow pipe shaft located coaxially with the rotation axis of the wire feeder, and a feeder cable passing through the rotating hollow pipe shaft to electrically couple the wire feeder with the industrial robot.

Applicants respectfully submit that none of the references, either individually or in combination, discloses a wire feeder that is rotatable around a rotation axis, and a rotating hollow pipe shaft located coaxially with the rotation axis of the wire feeder. Further, none of the references provides any reason to replace a normal rotating shaft for a wire feeder (e.g., shaft 74 of Takayanagi) with a rotating hollow pipe shaft. Accordingly, Haniya in view of Takayanagi and Terada fails to disclose, teach, or suggest "a wire feeder provided to the second arm and being rotatable relative to the second arm around a rotation axis...a rotating hollow pipe shaft located coaxially with the rotation axis of the wire feeder...and...a feeder

cable electrically coupling between an inside of the industrial robot and the wire feeder, the feeder cable passing through the rotating hollow pipe shaft,” as recited in claim 1.

It is because Applicants include the above features that the following advantages are achieved. “With such a structure, even when feeder 16 is rotated, layout of cable 22 inside shaft 21 constituting rotation axis 17A is not affected.” See the application at page 8, lines 16-17.

Accordingly, for the reasons set forth above, claim 1 is allowable over the cited art.

Claims 2 and 4-8 include all features of claim 1 from which they depend. Thus, claims 2 and 4-8 are also patentable over the art of record for the reasons set forth above.

Claims 9-14

Applicants’ invention, as recited by claim 9, includes a feature which is not disclosed, taught, or suggested by the cited art, namely:

...a second arm...

...a fourth arm attached to...one side face of the second arm...

...a wire feeder provided to the second arm...the wire feeder located opposite to the fourth arm relative to a rotating axis of the first arm.

The fourth arm and the wire feeder are both attached to the second arm. The wire feeder is located opposite to the fourth arm relative to the axis of rotation of the first arm. This feature is found in the original application, for example, at page 5, line 19 to page 6, line 24, and FIG. 4.

The Office Action acknowledges that Haniya fails to disclose “the wire feeder is located opposite to the fourth arm relatively to a rotating axis of the first arm.” Applicants respectfully submit that the addition of Takayanagi and Terada fails to make up for the deficiencies of Haniya with respect to claim 9.

As set forth above, Takayanagi is directed to a welding robot. As illustrated in FIGS. 1 and 2, for example, Takayanagi discloses a welding robot having a wire feeding device 7. Feeding device 7 is attached to a third arm 33 of the robot using a movable base 76. As

illustrated in FIG. 3, movable base 76 can be rotated around shaft 74. See Takayanagi at paragraph [0074].

The Office Action sets forth that "Takayanagi...teaches...the wire feeder 7 (fig. 1) is located opposite to...arm 33 (fig. 1) relatively to a rotating axis of...arm 31 (fig. 1)" (emphasis added). Applicants note that claim 9 requires that the wire feeder be located opposite from the fourth arm. Applicants submit that arm 33 of Takayanagi corresponds to the second arm of claim 9, and not the fourth arm. Instead, Applicants submit that arm 32 of Takayanagi corresponds to the fourth arm.

Takayanagi fails to disclose, teach, or suggest that arm 32 is attached to a side face of arm 33. To the contrary, as illustrated in FIGS. 1 and 2, it appears that arm 32 is attached to a top face of arm 33. Thus, in Takayanagi, arm 32 is not located on a side of arm 33 that is opposite to the wire feed unit 7. Takayanagi fails to disclose, teach, or suggest that arm 32 is located opposite the wire feed unit 7 relative to the axis of rotation of the first arm.

As set forth above, Terada fails to disclose a wire feeder. Thus, Terada also fails to disclose a wire feeder located opposite to the fourth arm relative to the axis of rotation of the first arm.

Accordingly, Applicants respectfully submit that Haniya in view of Takayanagi and Terada fails to disclose, teach, or suggest "a fourth arm attached to...one side face of the second arm [and] a wire feeder provided to the second arm...the wire feeder located opposite to the fourth arm relative to a rotating axis of the first arm," as recited in claim 9.

It is because Applicants include the above features that the following advantages are achieved. "Thus, fixing device 17 for fixing feeder 16 to second arm 14 can be commonly used at the time of floor-mounted use and the time of ceiling-mounted use." See the application at page 7, lines 18-20.

Accordingly, for the reasons set forth above, claim 9 is allowable over the cited art.

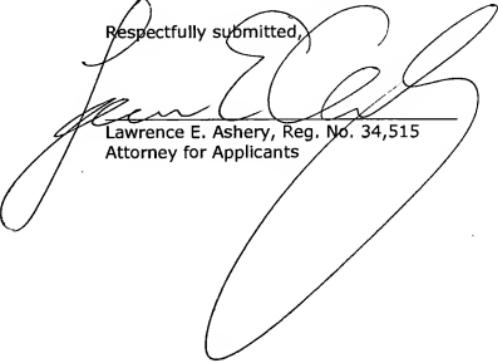
Claims 10-14 include all features of claim 9 from which they depend. Thus, claims 10-14 are also patentable over the art of record for the reasons set forth above.

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In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,


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